IBM System z Premier event

System z Server Strategy and Direction

Maximize the potential of new mainframe technology

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Today's Data Center is Under Pressure.

7 out of 10
companies

in the Global 1000 will need to modify their data centers to meet increased power and cooling requirements.

70 cents
per dollar

is spent maintaining current IT infrastructures rather than adding new capabilities.

78%
of CIOs

want to improve the way they use and manage their data.

Technology pressures

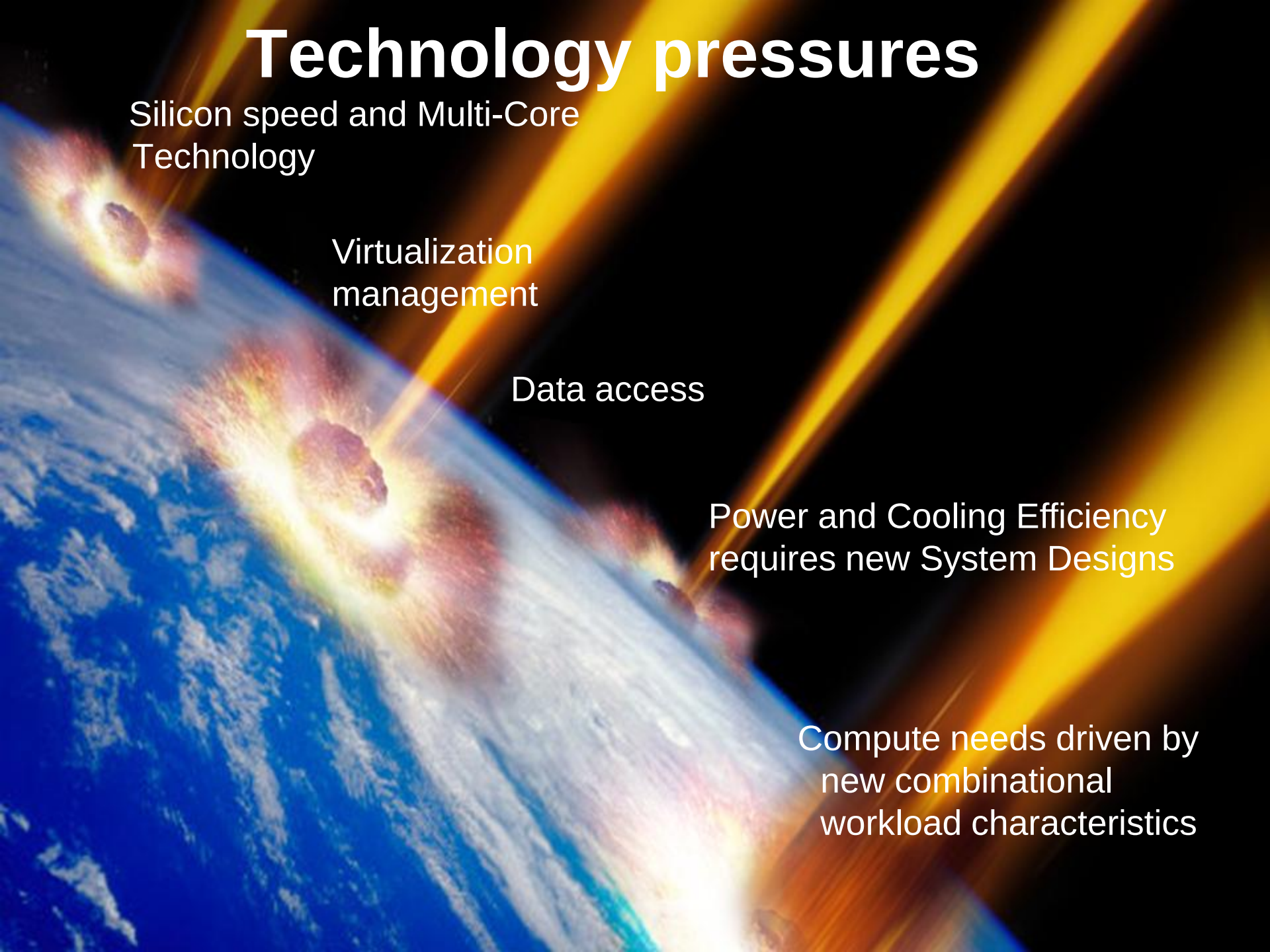
Silicon speed and Multi-Core Technology

Virtualization management

Data access

Power and Cooling Efficiency requires new System Designs

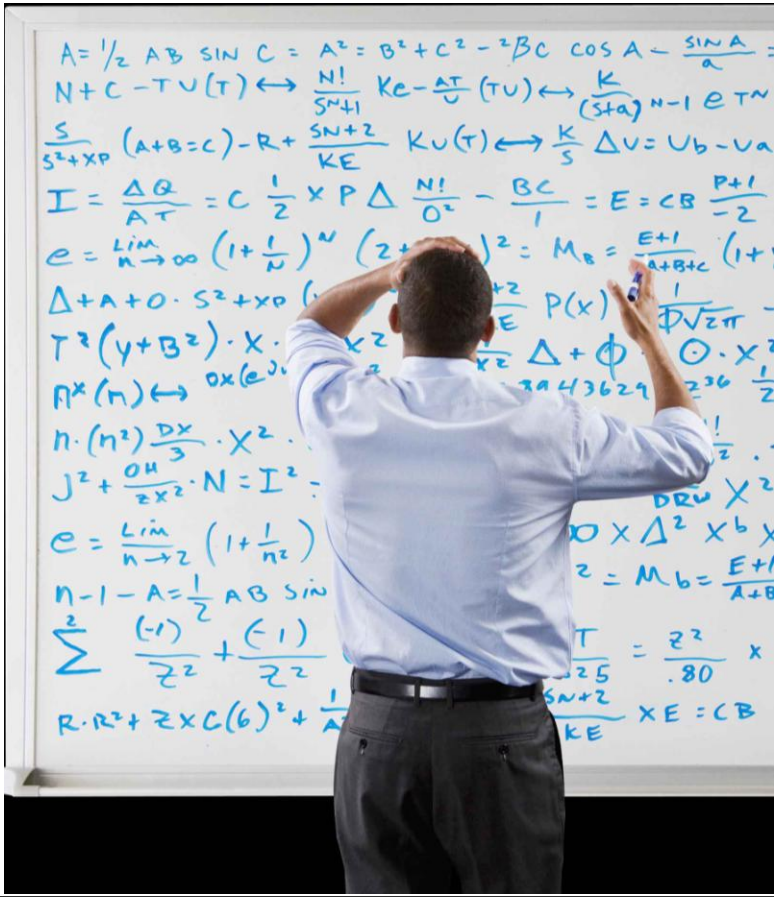
Compute needs driven by new combinational workload characteristics



Despite the allure of a *"one size fits all"* server approach …

Today's enterprise computing environments are multi-platform for a reason. They're optimized to run different workloads:

- Database and transaction processing
- Analytics
- Web-based interactions
- Enterprise applications such as ERP
- The myriad of x86 applications



Complex solutions are optimally deployed on multi-tier heterogeneous infrastructures …

… and cost less when System z is part of them

System z improves IT efficiency across industries*

44%

lower cost per credit card transaction

31%

lower IT spend per consumer loan

25%

lower cost per mega watt hour produced

24%

lower cost per hospital bed

20%

lower cost per airline passenger

26%

lower cost per new vehicle

25%

lower cost per retail store

23%

lower cost per barrel of oil

"… in the long run, the marketplace ***rewards those that make the optimum use of the right computing resources in the right way*** *as evidenced by business performance."*

*-- * Dr. Howard Rubin, CEO and Founder Rubin Worldwide*

* Ba*sed on an analysis of actual IT spend and business performance, comparing* companies with greater than average mainframe mix vs. less than average mainframe mix …

Innovation that formed and transformed the mainframe

1964
IBM System/360™

Centralized computing for back-office

Application portability between systems

Peripheral plug compatibility

1972
VM Virtualization

Shared resources and utilization improvements for a greater number of system users

Architecture implementations spanning hardware and software

1980's
Batch and on line growth

Technologies to improve sharing, data protection, scalability as the information management needs explode

1990
System/390
Sysplex®

Communications and resiliency between application instances on one or more computers

Enhanced in 1993 as Parallel Sysplex, which remains today as a leading clustering mechanism

1993
IBM System/390®
Bipolar to CMOS

Critical technology change point to enable improved economics, improved long term performance growth

2000
IBM eServer™
zSeries® 900
Linux® on Mainframe

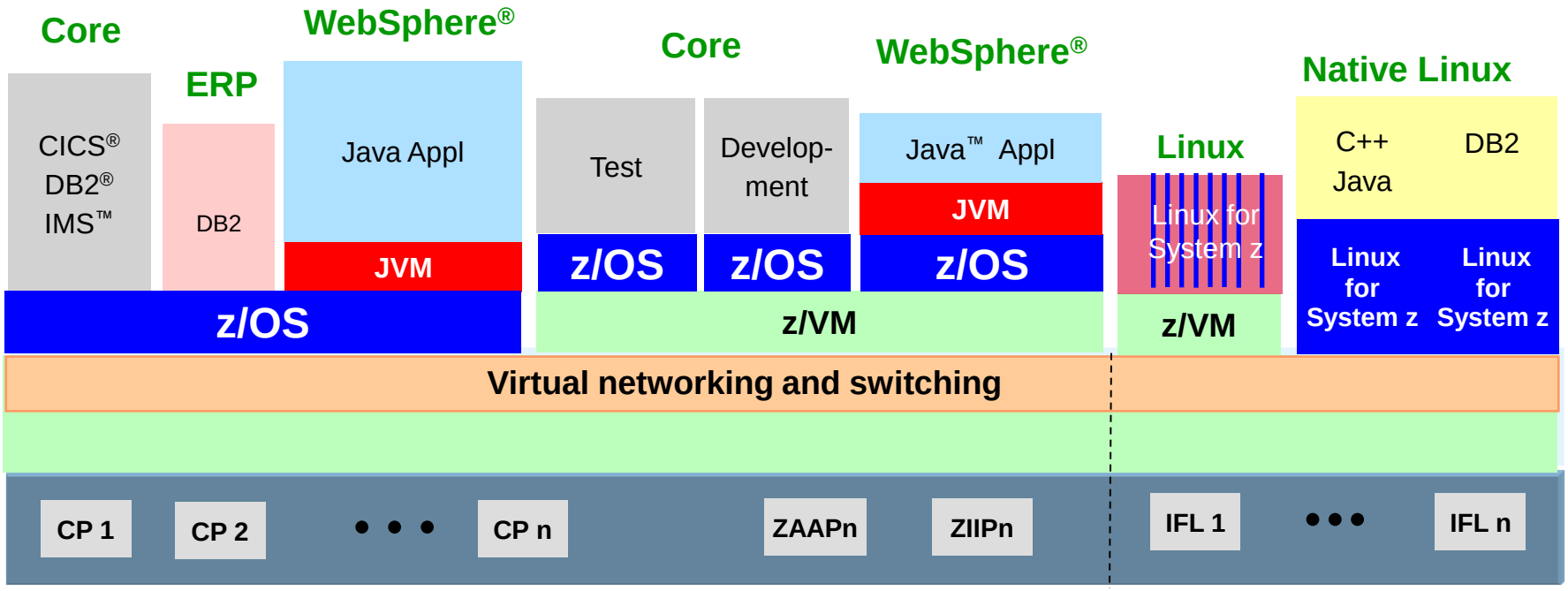
Specialty processor to bring mainframe qualities of service to Linux applications

Supplemented in 2004 with zAAP and 2006 for zIIP, whose combined benefits have resulted in significant workload growth

2010
zEnterprise

Workload optimization across different system architectures, but representing themselves as an integrated resource pool to a variety of workloads

System z – Integrated workloads



- **Massive, robust consolidation platform**
- **virtualization is built in**
- **100's to 1000's of virtual servers on z/VM**
- **Intelligent and autonomic management of diverse workloads and system resources**

System z Today – areas of use and workload expansion

1. Information Management on System z

- Data Management on System z (data base)
- Data Warehousing
- Business Analytics and Optimization
- IBM Smart Analytics Optimizer
- Competitive migrations / New Accounts
  - Numius, UNC

2. Business Applications

- SAP Solutions
- ACI, Core Banking Applications
- Chordiant and other ISV' applications
- Competitive migrations/New Accounts
  - IBK, Banco Pastor

3. IT Optimization and Consolidation

- TCO/TCA
- Competitive Consolidations from UNIX®/x86
- Oracle Consolidations
- Cloud Computing
- Domino®
- Enterprise Linux Server/New Accounts
  - CNNIC, Handelsbanken

4. Enterprise Modernization

- WebSphere® on System z
- Rational® on System z
- Portal on System z
- Modernizing competitive software stacks (ie. SW, AG, CA, etc.) with IBM solutions
  - NYS Dept. of Taxation and Finance

Foundational Competencies

- Virtualization
- Resiliency
- Systems Management
- Security
- zGovernance (Platform Management)

We need Smarter Systems

and software for enterprise computing and robust cloud environments that …

… unify and optimize multiple systems to work as a single, integrated service delivery platform

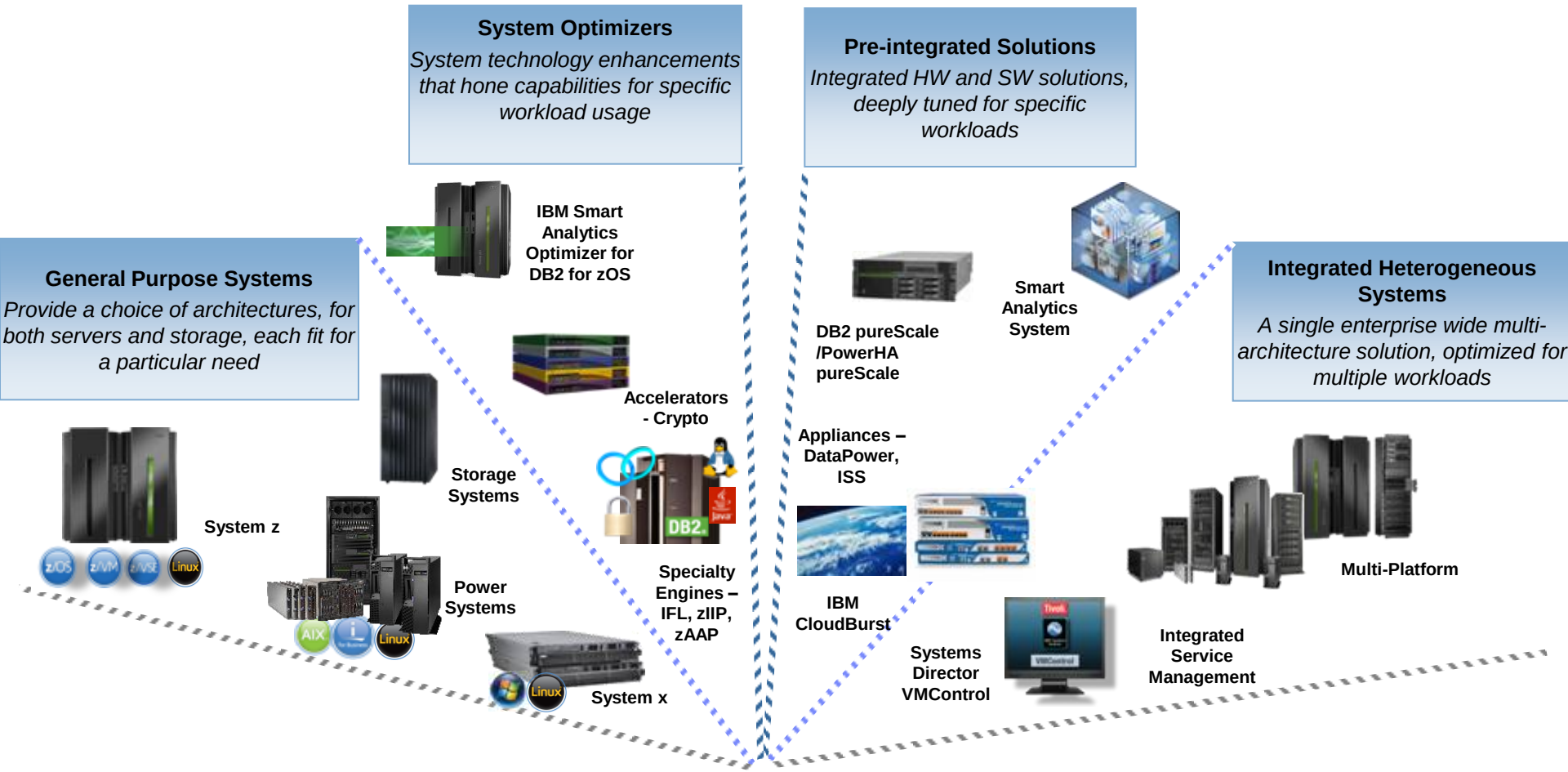
… can scale without adding complexity to meet the growing demands on the infrastructure

… simplify data center management

… can turn IT into a catalyst for business innovation and growth

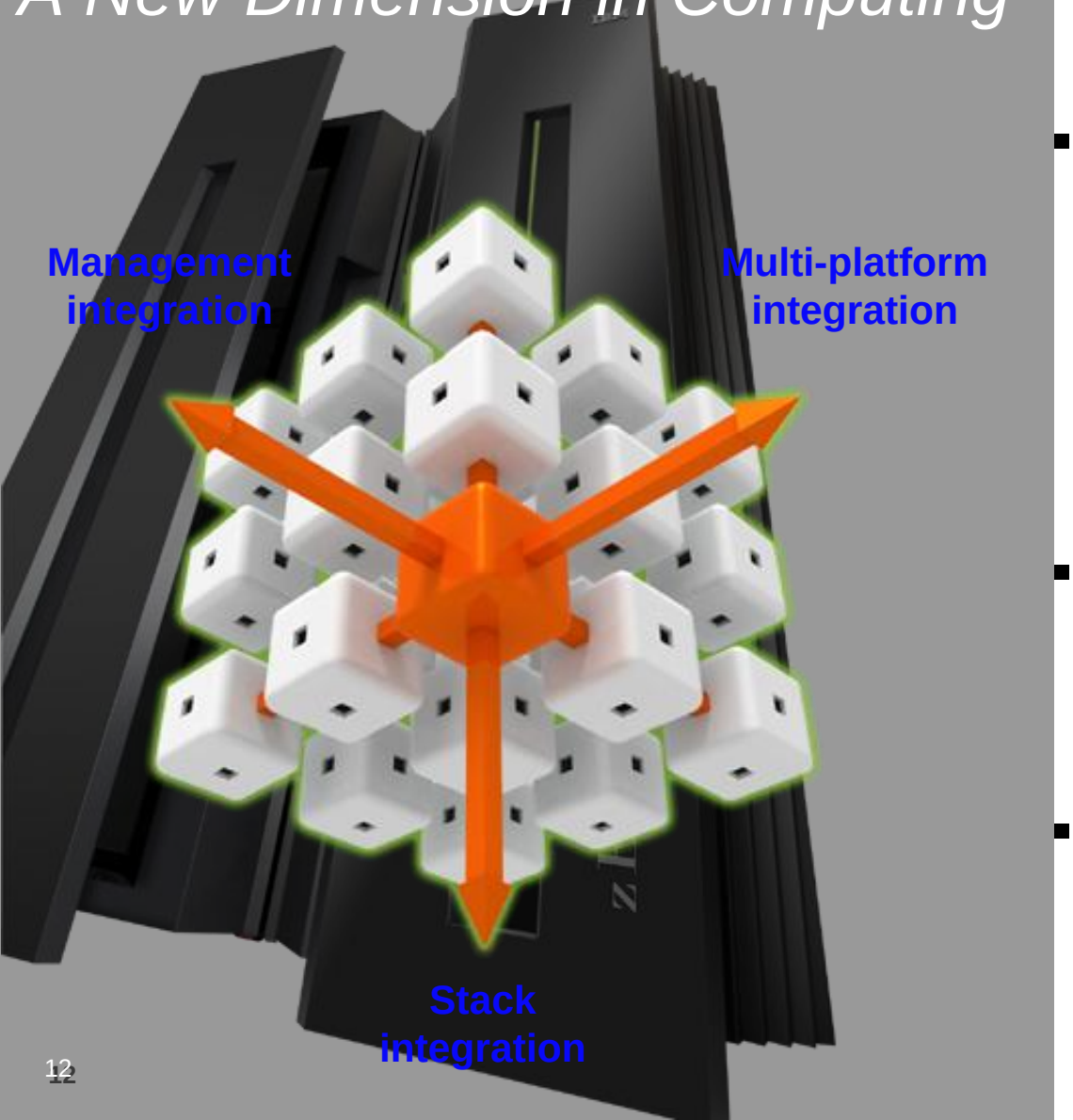
Workload Optimized Systems

Solutions across a spectrum of value designed to best address the unique requirements of the different workloads they support



Announcing the IBM zEnterprise System

A New Dimension in Computing



- A “System of Systems”, integrating IBM’s leading technologies to dramatically improve productivity of today’s multi-architecture data centers and tomorrow’s private clouds.
- The world’s fastest and most scalable enterprise system with unrivalled reliability, security, and manageability.
- The industry’s most efficient platform for large scale data center simplification and consolidation.

IBM zEnterprise System – Best-in-class systems and software technologies

A "System of Systems" that unifies IT for predictable service delivery

IBM zEnterprise 196 (z196)

Optimized to host large-scale database, transaction, and mission-critical applications

The most efficient platform for large-scale Linux consolidation

Capable of massive scale-up

New easy-to-use z/OS V1.12

zEnterprise Unified Resource Manager

Unifies management of resources, extending IBM System z qualities of service end-to-end across workloads

Provides platform, hardware and workload management

zEnterprise BladeCenter Extension (zBX)

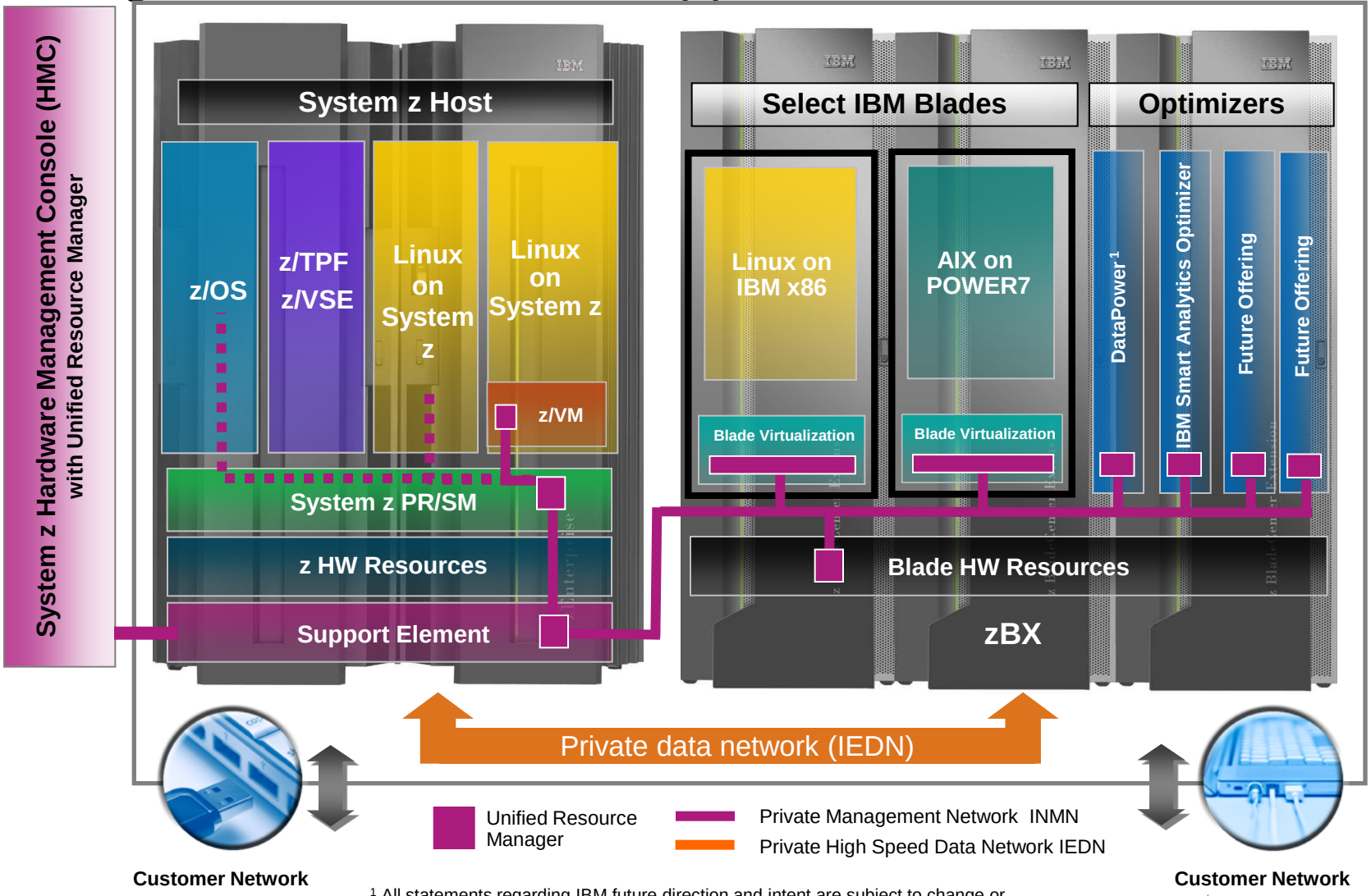
Selected IBM POWER7 blades and IBM x86 Blades* for tens of thousands of AIX and Linux applications

High-performance optimizers and appliances to accelerate time to insight and reduce cost

Dedicated high-performance private network

A look inside the IBM zEnterprise System

Enabling a new dimension in application architecture



[1] All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.

IBM zEnterprise 196: The heart of the new machine

The industry's fastest and most scalable enterprise system

Dramatic improvement over IBM System z10™:

For Linux

Up to **60%** Improvement in performance

for **35%** Less cost

For z/OS

Up to **40%** Improvement in performance

with **60%** More capacity

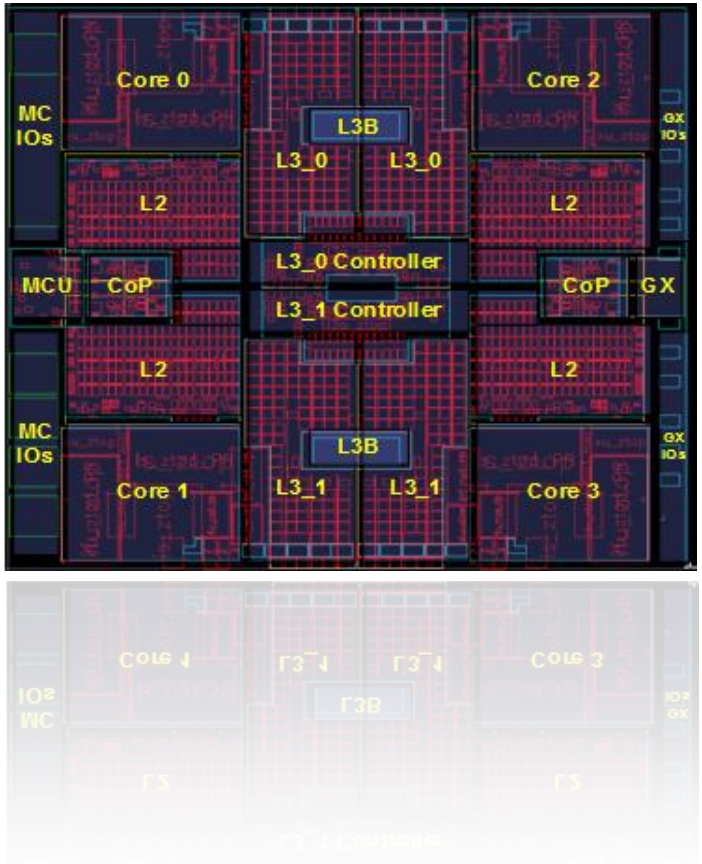
With no increase in energy consumption

And even better performance with new software

- 5.2 GHz superscalar processor
- Up to 96 Cores, 1 to 80 configurable for client use
- Up to 3 TB RAIM memory
- Over 100 new instructions
- 1.5 MB L2 Cache per core, 24 MB L3 Cache per processor chip
- Cryptographic enhancements
- Optional water cooling
- z/OS, z/Linux, z/VM. z/TPF, z/VSE

z196 – IBM Leadership Technology At the Core

- New 5.2 GHz Quad Core Processor Chip boosts hardware price/performance
  - 100 new instructions – improvements for CPU intensive, Java™, and C++ applications
  - Over twice as much on-chip cache as System z10 to help optimize data serving environment
  - Out-of-order execution sequence gives significant performance boost for compute intensive applications
  - Significant improvement for floating point workloads
- Performance improvement for systems with large number of cores – improves MP ratio
- Data compression and cryptographic processors right on the chip

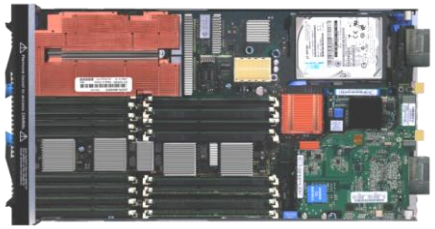


IBM POWER7 and System x[1] Blades

General purpose processors under one management umbrella

What is it?

The zBX infrastructure can host select IBM POWER7 and IBM x86 blades. Each blade comes with an installed hypervisor that offers the possibility of running an application that spans z/OS, Linux on System z, AIX on POWER®, or Linux on System x (SOD) [1] but have it under a single management umbrella.



How is it different?

- Complete management: **Advanced management brings operational control and cost benefits, improved security, workload management based on goals and policies.**
- Virtualized and Optimized: **Virtualization means fewer resources are required to meet peak demands with optimized interconnection.**
- Integrated: **Integration with System z brings heterogeneous resources together that can be managed as one.**
- Transparency: **Applications certified to run on AIX 5.3 or 6.1 will also be certified and run on the POWER7 blade. No changes to deployed guest images.**
- More applications: **Brings larger application portfolio to System z.**

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Management Stack

Building an architectural construct of hardware, software, services

Service Management

- Visibility, Control and Automation for Applications, Transactions, Databases and Data Center Resources
- End-to End Workload Management and Service Level Objectives that Align IT Management with Business Goals
- Common Usage and Accounting for business accounting
- Dynamic/Centralized Management of Application Workloads based on Policies
- Business Resilience for multi-site recovery
- End-to-end Enterprise Security

Platform Management

- Workload based Resource Allocation and Provisioning for zEnterprise
- Physical and Virtual Resource Management (Server, Storage, Network)
- Goal Oriented Resource Management of zEnterprise (Availability, Performance, Energy, Security)
- Ensemble Network and Storage Management

Extending with

Unified Resource Manager

- **Hypervisor management and creation of virtual networks**
- **Operational controls, service and support for hardware / firmware**

Hardware Management

- Configuration management for hardware / firmware
- Operational controls for the hardware / firmware
- Service and Support for the hardware / firmware
- Lifecycle management for the platform's virtual resources

- **Network management of private and secure data and support networks**
- **Energy monitoring and management**
- **Workload awareness and platform performance management**
- **Virtualization management – single view of virtualization across the platform**

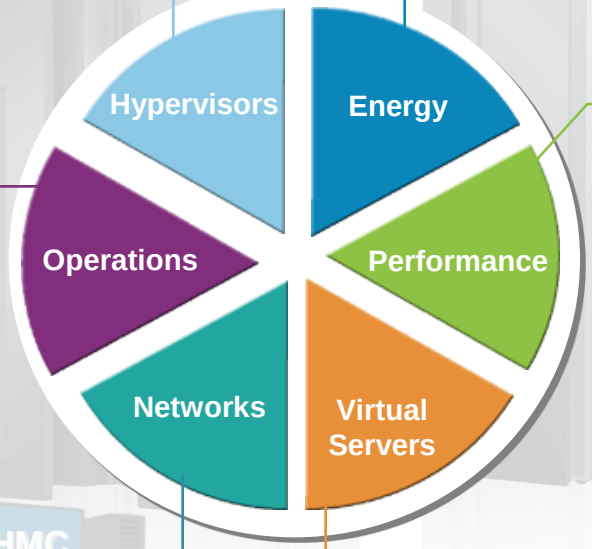
… Value Made Possible By the Unified Resource Manager

Simplified installation of hypervisors

Gain significant time to market with improved speed of deployment

Simplified energy management

Energy cost savings



Save time, cost and simplify asset management

Decrease problem determination and resolution time for cross-platform resources

Improve and simplify cross-platform availability procedures

Enable broader and more granular view of resource consumption

Allow critical workloads to receive resources and priority based on goal-oriented policies established by business requirements

Smart business adjustments based on workload insight

Provide deep insight into how IT resources are being used

Factory installed and configured network

Improved network security with lower latency, less complexity, no encryption/decryption

Gain flexibility, consistency and uniformity of virtualization

Provide the business with faster time to market

Simplified network management for applications

ge suite
Automate suite

IBM Smart Analytics Optimizer

Capitalizing on breakthrough technologies to accelerate business analytics

What is it?

The IBM Smart Analytics Optimizer is a workload optimized, appliance-like, add-on, that enables the integration of business insights into operational processes to drive winning strategies. It accelerates select queries, with unprecedented response times.

How is it different?

- Performance: **Unprecedented response times to enable 'train of thought' analyses frequently blocked by poor query performance.**
- Integration: **Connects to DB2® through deep integration providing transparency to all applications.**
- Self-managed workloads: **Queries are executed in the most efficient way.**
- Transparency: **Applications connected to DB2, are entirely unaware of IBM Smart Analytics Optimizer.**
- Simplified administration: **Appliance-like hands-free operations, eliminating many database tuning tasks.**

Faster insights for enabling new opportunities

WebSphere DataPower[1] Appliance in the zBX

Purpose-built hardware for simplified deployment and hardened security

What is it?

The IBM WebSphere DataPower appliance (SOD)[1] integrated in the zEnterprise System, can help simplify, govern, and enhance the security of XML and IT services by providing connectivity, gateway functions, data transformation, protocol bridging, and intelligent load distribution.

How is it different?

- Security: **VLAN support provides enforced isolation of network traffic with secure private networks. And integration with RACF® security.**
- Improved support: **Monitoring of hardware with "call home" for current/expected problems and support by System z Service Support Representative.**
- System z packaging: **Increased quality with pre-testing of blade and zBX. Upgrade history available to ease growth. Guided placement of blades to optimize.**
- Operational controls: **Monitoring rolled into System z environment from single console. Time synchronization with System z. Consistent change management with Unified Resource Manager.**

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Cloud computing: More value with zEnterprise

Security

Industry-leading security at the core of an integrated infrastructure

Identifies potential fraud in Real Time

Availability

Resiliency management and fewer points of failure

Centralized workload management aligned to business priorities

Scalability

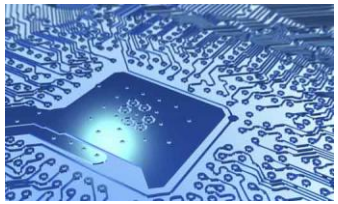
Ability to meet massive demands from users and data

Unmatched scalability with the highest transaction processing capacity

Efficiency

Economies of scale for labor, software and environmental costs

Reduce labor, energy, and development costs



Virtualization

Centralize management of virtual servers across a heterogeneous pool

Enable thousands of virtual servers within a single integrated system

IBM has been collaborating with clients to prepare for this day

BANKING	INSURANCE	RETAIL	HEALTHCARE	PUBLIC SECTOR
				
Core Banking	***Internet Rate Quotes***	***Online Catalog***	***Patient Care Systems***	***Electronic IRS***
Wholesale Banking – Payments	***Policy Sales & Management (e.g. Life, Annuity, Auto)***	***Supply Chain Management***	***Online Claims Submission & Payments***	***Web-based Social Security***
Customer Care & Insight	***Claims Processing***	***Customer Analysis***		

Retail client using SAP financials

***The Future:* DB2 for z/OS with Application Server on POWER7 Blades + Future exploration of SAP Business Warehouse Accelerator on x86 Blades**

Client Pains

- Resource intensive and vulnerable to several points of impact
- Too many network hops
- Outages when applying microcode updates
- Multiple software tools and software process for site failovers

Benefits

- Consistency of business controls
- Monitor and manage applications end to end
- Manage, maintain and provision resources with true application insulation
- Better utilization of assets
- Insulate application development teams from infrastructure technology
- Consolidation of skills through consistent tools

Public sector client develops an Internet tax application

The Future: **DB2 z/OS with Application Server on POWER7 Blades in zBX, IBM WebSphere® DataPower**

Client Pains

- Not able to respond quickly for need of new function
- High cost of staff required to maintain multi-tier application

Benefits

- Network speed increased by ten times
- Single workload management view across multiple platforms reducing labor overhead
- Everything is pre-tested, pre-configured for their mission-critical application

Banking client enables Internet banking

The Future: **System z (IMS™/CICS/DB2); p7 Blades running AIX for WebSphere and IBM System x Blades running Linux**

Client Pains

- Extremely complex environment
- Majority of maintenance applied to systems manually
- Several single points of failure
- Bank presence in multiple countries across Europe and are maintaining different infrastructures based on acquisitions

Benefits

- Increased flexibility through simplification and standardization
- Lower cost through a single management and policy framework
- Reduced risk by extending System z Quality of Service to multiple platforms
- Better service to users from improved resource management
- Greater focus on delivering new business functions through reduced manual coordination of tasks

zEnterprise provides the foundation for the "smart" infrastructure on which we can build the workloads of today and tomorrow

- **They are workloads that …**
  - Rely on data serving and application components on IBM System z
  - Solutions that need to leverage strengths of System z – Security, Reliability, Availability
  - Have application components on Power or x86 but require a higher level of integration capabilities and efficiency
- **… and/or …**
  - Reside in low utilization / development environments
  - Can be made more efficient through consolidation
  - Can be optimized by using the newest virtualization technology
- **… but also may …**
  - Reside in complex multi-platform IT environments
  - Require flexible development and test infrastructure
  - Require simplified, integrated policy and management

IBM Services

Help get the most for your business from the zEnterprise System

Assess and design an IT architecture to optimize for business advantage

- Develop a business case and high level transition plan
- Fit-for-purpose analysis
- Deliver a roadmap for an adaptable and efficient infrastructure that integrates IT and business strategy and priorities

Build and run a smarter system with services for zEnterprise

- Migrate effectively and efficiently to zEnterprise environment.
- Create a more cost-effective and manageable computing environment with server optimization, integration, and implementation services
- Enhance and simplify cross-platform high availability
- Effectively run and manage zEnterprise with maintenance and technical support services

The IBM zEnterprise System

Now extending System z cost savings and value to a new dimension

- **Designed to meet the need of today's heterogeneous data centers**
- **Enables a mixed set of workloads to be deployed on best fit technologies**
- **Delivers lower acquisition and operating costs than a "one size fits all" approach**
- **Reduces risk by extending the reach of System z Qualities of Service**
- **Improves service through tighter integration for multi-tier workloads**


Thank You